

# **MPS-H-3 SERIES DC POWER SUPPLY USER MANUAL**

## Preface

Respected users:

Hello! Thank you for purchasing a brand-new MATRIX instrument. In order to use this instrument correctly, please read the full text of this manual carefully before using this instrument, especially the "safety precautions" part. If you have read the full text of this manual, it is recommended that you keep this manual properly and place it with the instrument or put it in a place where you can read it at any time for future use.

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## Calibration and calibration statement

The company specifically declares that the equipment listed in this manual fully complies with the specifications and characteristics stated in the company's technical specifications. This instrument has been verified by our company before leaving the factory. The verification procedures and steps are in compliance with the specifications and standards of the Electronic Inspection Center.

## Product quality assurance

The company guarantees that the new products manufactured by the company have undergone strict quality confirmation. At the same time, it is guaranteed that within one year of leaving the factory, if there is any construction defect or part failure of the product, the company is responsible for repairing it for free. However, if the user changes the circuit, function, or repairs the instrument and parts or the outer box is damaged, the company will not provide free warranty service. If all the ground wires are not properly connected in accordance with the regulations or the machine is not operated in accordance with safety regulations and abnormal conditions occur, our company will not provide free warranty service. This warranty does not include accessories that are not produced by our company, such as the accessories of this instrument. During the one-year warranty period, please return the faulty unit to the maintenance center of our company or the dealer designated by our company, and the company will repair it properly. If the unit fails under abnormal use, human negligence, or non-human control, such as earthquake, flood, riot, or fire and other non-human control factors, the company will not provide free warranty service. (The company follows the sustainable development strategy and reserves the right to improve the contents of this manual without prior notice)



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## Chapter 1 Product Introduction

MPS-H-3 series DC power supply is a new generation of high-quality linear DC power supply, both channels can independently adjust the voltage and current, one fixed 5V/3A output, stable voltage and current automatic conversion, high stability, high reliability, and high precision . Two channels can display output voltage and current simultaneously, which has a very high cost-effective advantage.

This series of power supplies have the following characteristics:

- Infinite servo, intelligent fan system,
- With voltage and current preset function,
- Independently control output ON/OFF,
- Over temperature protection (OTP) function,
- 10mV, 1mA high resolution,
- Voltage and current range limit function,
- Both channels can independently adjust voltage and current,
- One-key series and parallel function,
- In parallel mode, positive and negative voltages can be formed.



## Chapter 2 Technical Specifications

### 2.1 Main technical specifications

MPS-H-3 series DC power supply technical specification table:

Model No.		MPS-3003H-3			MPS-3005H-3			MPS-3010H-3			MPS-6003H-3			MPS-6005H-3		
Channel		CH1	CH2	CH3	CH1	CH2	CH3	CH1	CH2	CH3	CH1	CH2	CH3	CH1	CH2	CH3
Rated output	voltage	0~30V	0~30V	5V	0~30V	0~30V	5V	0~30V	0~30V	5V	0~60V	0~60V	5V	0~60V	0~60V	5V
	Current	0~3A	0~3A	3A	0~5A	0~5A	3A	0~10A	0~10A	3A	0~3A	0~3A	3A	0~5A	0~5A	3A
Rated load regulation	voltage	$\leq 0.01\%+5mV$	$\leq 15mV$	$\leq 0.01\%+5mV$	$\leq 15mV$	$\leq 0.01\%+8mV$	$\leq 15mV$	$\leq 0.01\%+5mV$								
	current	$\leq 0.1\%+5mA$	-	$\leq 0.1\%+5mA$												
Line regulation	voltage	$\leq 0.01\%+5mV$	-	$\leq 0.01\%+5mV$	-	$\leq 0.01\%+8mV$	-	$\leq 0.01\%+5mV$								
	current	$\leq 0.1\%+5mA$	-	$\leq 0.1\%+5mA$												
Setting resolution	voltage	10mV	-	10mV												
	current	1mA	-	1mA												
Readback resolution	voltage	10mV	-	10mV												
	current	1mA	-	1mA												
Settgin accuracy	voltage	$\leq 0.03\%+10mV$	-	$\leq 0.03\%+10mV$												
	current	$\leq 0.1\%+5mA$	-	$\leq 0.1\%+5mA$												
Readback accuracy	voltage	$\leq 0.03\%+10mV$	-	$\leq 0.03\%+10mV$												
	current	$\leq 0.1\%+5mA$	-	$\leq 0.1\%+5mA$												
Parallel mode	Power effect	$\leq 0.01\%+5mV$	-	$\leq 0.01\%+5mV$	-	$\leq 0.02\%+8mV$	-	$\leq 0.02\%+5mV$								
	Load regulation	$\leq 0.01\%+5mV$	-	$\leq 0.02\%+5mV$	-	$\leq 0.02\%+8mV$	-	$\leq 0.02\%+5mV$								
Series mode	Power effect	$\leq 0.01\%+5mV$	-	$\leq 0.01\%+5mV$	-	$\leq 0.01\%+8mV$	-	$\leq 0.01\%+5mV$								
	Load effect	$\leq 0.01\%+5mV$	-	$\leq 0.02\%+5mV$	-	$\leq 0.01\%+8mV$	-	$\leq 0.01\%+5mV$								
Ripple and noise	voltage	$\leq 2mV(rms)$														
	current	$\leq 5mA(rms)$														
Interface	Optional USB、RS232															
Using environment	0~50℃ $\leq 80\%RH$															
Size (W*H*D)	mm	250*150*330														
Weight	kg	8			9			12			9			9		

### 2.2 Additional features

Recommended calibration frequency: 1 year/1 time

Cooling method: forced air cooling

Operating environment temperature: 0 to 40 °C

Storage temperature: -15 to 80 °C

Use environment: indoor use design, pollution level 2, maximum humidity 80%RH.

## Chapter 3 Quick Start

This chapter will briefly introduce the appearance and basic functions of the MPS-H-3 series DC power supply, so that you can quickly know about the MPS-H-3 series DC power supply. At the same time, it will tell you the basic inspections to be done after getting the power supply to ensure the normal operation of the product.

### 3.1 Introduction to the front and rear panels

The front panel of MPS-H-3 series DC power supply is shown in the figure below.

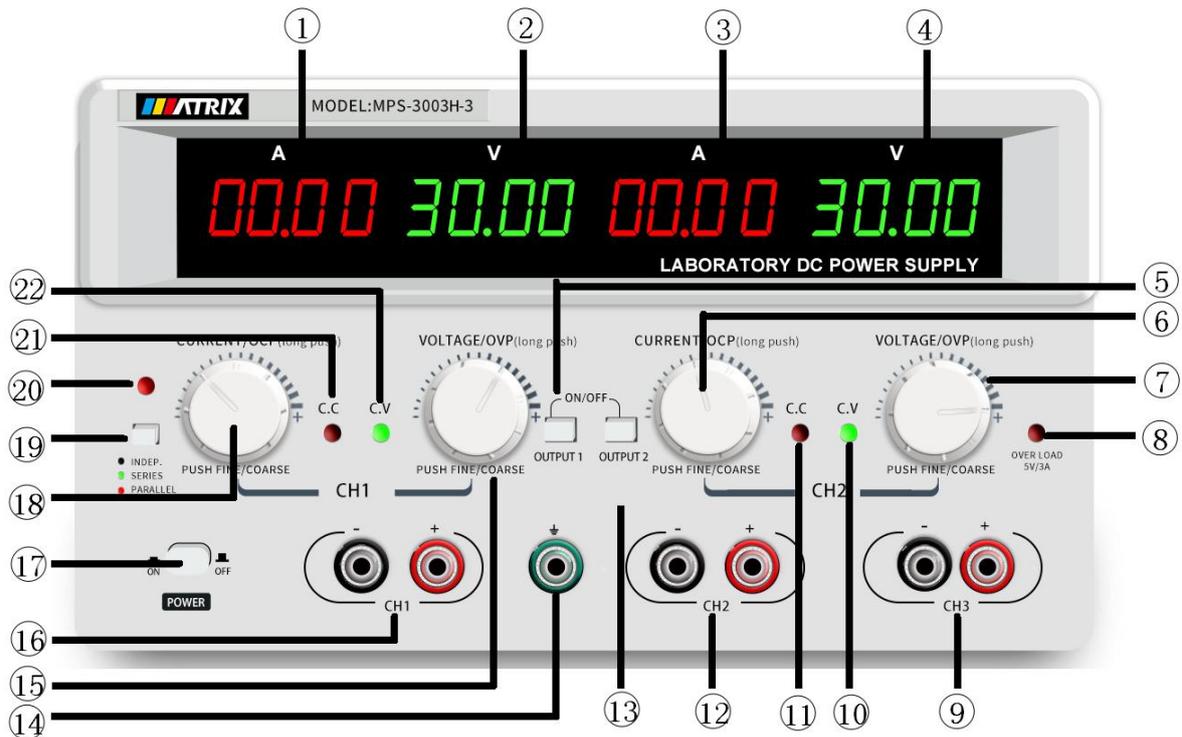


Figure 3.1

- ① CH1 current display window,
- ② CH1 voltage display window
- ③ CH2 current display window
- ④ CH2 voltage display window
- ⑤ CH1 output switch
- ⑥ CH2 current adjustment knob
- ⑦ CH2 voltage adjustment knob
- ⑧ CH3 overload indicator
- ⑨ CH3 output terminal
- ⑩ CH2 constant pressure indicator
- ⑪ CH2 constant current indicator
- ⑫ CH2 output terminal
- ⑬ CH2 output switch
- ⑭ Ground terminal
- ⑮ CH1 voltage adjustment knob
- ⑯ CH1 output terminal
- ⑰ Instrument power switch

- ⑮ CH1 current adjustment knob
- ⑯ One-key series/parallel/function button
- ⑰ Series and parallel indicator lights
- ⑱ CH1 constant current indicator
- ⑳ CH1 constant pressure indicator

The rear panel of MPS-3003H-3 series DC power supply is shown in the figure below.

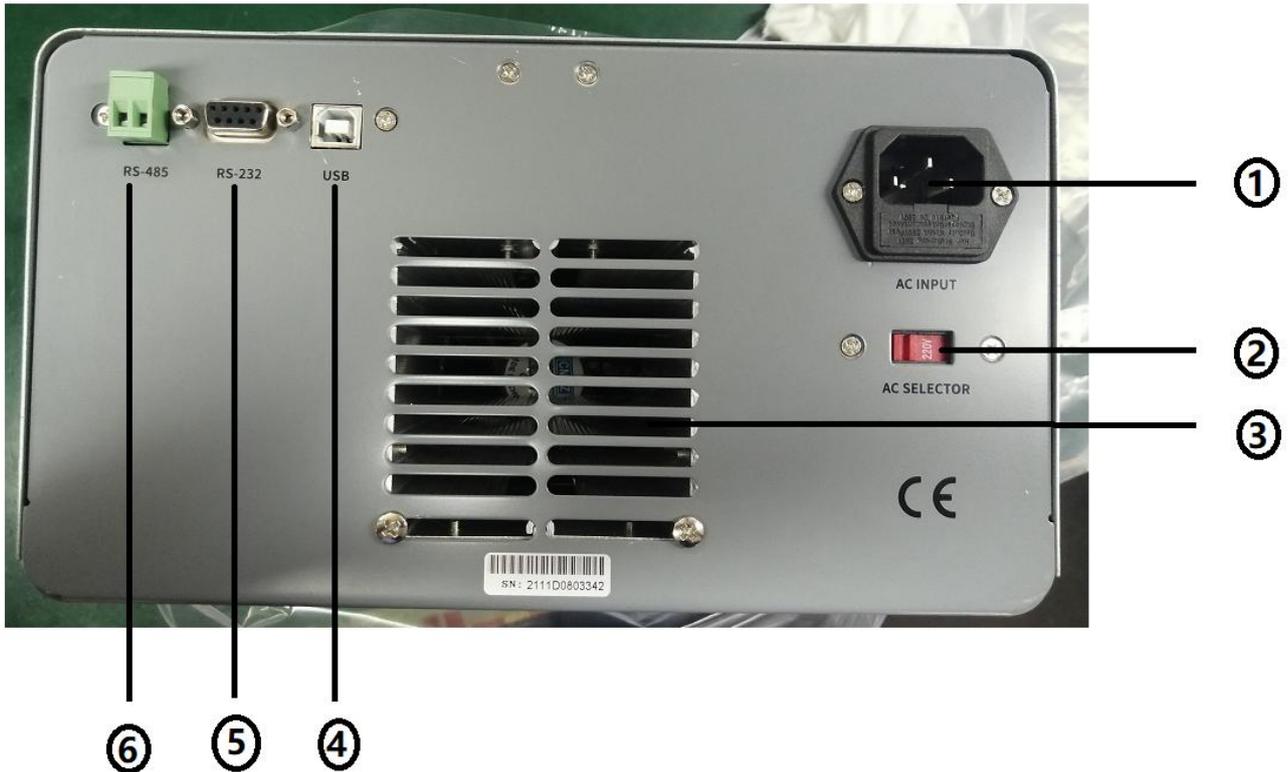


Figure 3.2 Rear panel of MPS-H-3 series DC power supply

- ① Instrument power input socket
- ② Instrument power input switch
- ③ Heat dissipation hole
- ④ USB interface
- ⑤ RS-232 interface
- ⑥ RS-485

**USB and RS-232/485 interface are optional**

### 3.2 Pre-check

Please follow the steps below to check the power supply to ensure that the power supply can be used normally.

#### 1. Inspection



Please check whether you have received the following accessories when you receive the power supply. If any are missing, please contact your nearest dealer.

- A power cord (conforms to the voltage standard used in the region)
- An user manual
- A warranty card

2. Connect the power cord and turn on the power

After power-on, the power supply first conducts a system self-test, and then enters the standby state.

 **Warning:** A three-core power cord is provided when the power supply is shipped from the factory. Your power supply should be connected to a three-core junction box. Before operating this power supply, make sure that the power supply is well grounded.

### 3.3 If the power fails to start

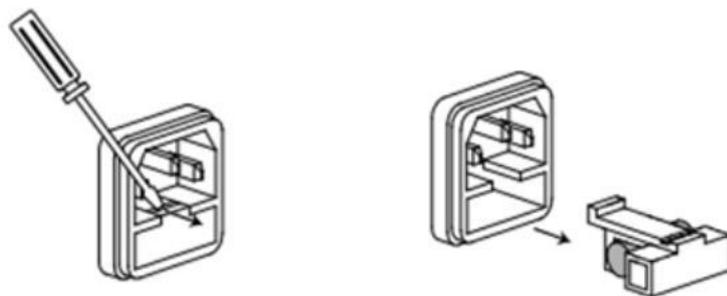
Use the following methods to solve the problems you may encounter when turning on the power.

1. Check if the power cord is connected

Model	Fuse specification	
	230V	115V
MPS-3003H-3	5A	8A
MPS-3005H-3	6A	10A
MPS-3010H-3	8A	15A
MPS-6003H-3	6A	10A
MPS-6005H-3	8A	15A

2. How to replace the fuse

Use a screwdriver to open the small plastic cover under the power input socket on the rear panel of the power supply (as shown in the figure below), and you can see the fuse. Please use a fuse of the same specification.





## Chapter 4 Operation Instructions

This chapter will introduce the operation of the front panel of the power supply in detail, divided into the following parts:

- Voltage/current setting
- Output on/off operation
- Series/parallel setting operation
- Menu setting operation
- CH3 function introduction
- Introduction of initialization function

### 4.1 Voltage/current setting

When the power supply is in standby or output mode, lightly press the voltage/current knob, the corresponding setting position on the screen will flash. At this time, you can turn the knob left and right to change the setting value. When the setting value is flashing, press the knob again to change the setting position. If no operation is performed on the knob within 5 seconds, the system will automatically exit the setting state.

Remarks:

1. The voltage/current setting methods of CH1 and CH2 are the same.

### 4.2 Output on/off operation

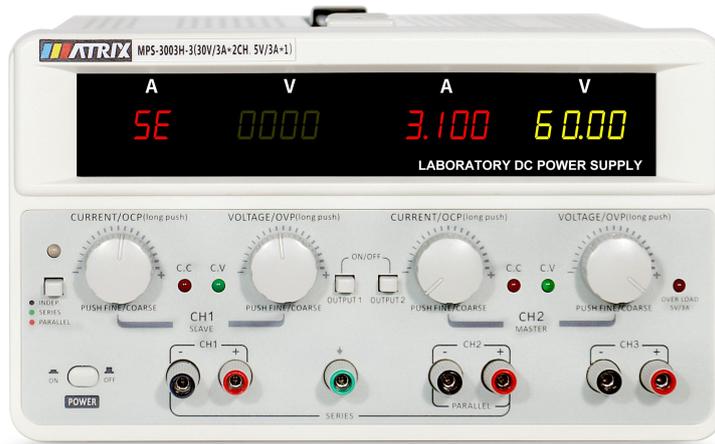
1. When the power is on, the ON/OFF button can be used to control the on/off working status of the power output.

Remarks:

1. The "OUTPUT1" button controls the on/off working status of power supply CH1,
2. The "OUTPUT2" button controls the on/off working status of the power supply CH2,
3. In parallel or series mode, the main circuit "OUTPUT2" button controls the power on/off working status,
4. The function of "OUTPUT1" button is invalid in parallel or series mode.

### 4.3 Series/Parallel setting operation

When the power supply is in standby or output state, lightly press the "one-key series/parallel connection button" on the left, the power supply will enter the series/parallel working state, and the CH1 current window will prompt the corresponding working state, as shown in the figure:



Series mode



Parallel mode



Independent mode

Remarks:

1. Lightly press the "one-key series/parallel/function menu button" on the left once the power supply will enter the series working state, and the current window will prompt "SE" series and parallel indicator lights to show green, as shown in the figure "series mode", the output should Connect the negative terminal of CH1 and the positive terminal of CH2, and the main circuit "OUTPUT2" button controls the power on/off working status.
2. Lightly press the "one-key series/parallel connection/function menu button" on the left. The secondary power supply will enter the series/parallel operation state, and the current window will prompt the "PA" series/parallel indicator to show red, as shown in the figure "Parallel Mode". When the output is recommended to be connected to



the positive and negative ends of CH2, the main circuit "OUTPUT2" button controls the on/off working status of the power supply. If the current is too large, it is recommended to use a suitable wire to connect the CH1 and CH2 terminals to the positive and the positive externally. Negative and negative are connected together.

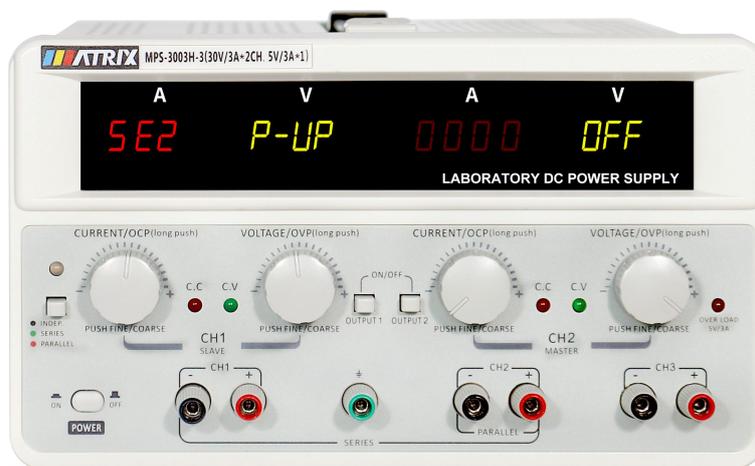
3. Tap the left "one-key series/parallel/function menu button" three times, the power supply will return to independent working state, as shown in the figure "independent mode", the series and parallel indicator lights are off, and CH1 and CH2 are no longer associated.

4.4 Menu setting operation Long press the left "one-key series/parallel/function menu button" power supply will enter the menu setting mode, the setting content is as follows:

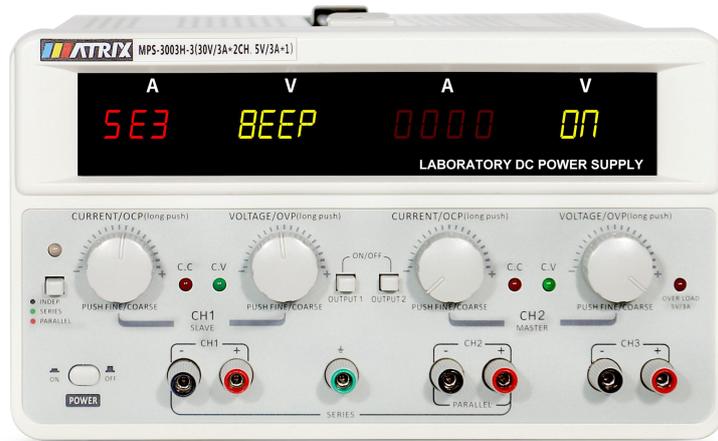
1. Power-on parameter retention setting: SE1 P-ST ON/OFF (ON is to retain the data at the last power-off, OFF is to retain the factory default value, use the CH1 current knob to switch menu steps, and use the CH2 voltage knob to switch ON/OFF Status, tap "One-key series/parallel/function menu button" to exit the menu.)



2. Output state setting when power on: SE2 P-UP ON/OFF (ON means power-on to keep output status, OFF means power-on to keep off status, use CH1 current knob to switch menu steps, CH2 voltage knob to switch ON/OFF status, Tap the "one-key series/parallel/function menu button" to exit the menu.)



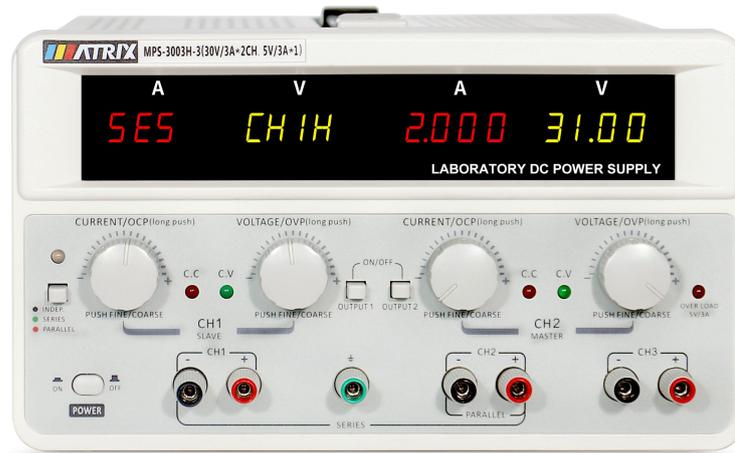
3. Buzzer sound setting: SE3 BEEP ON/OFF (ON means the buzzer sound is turned on, OFF means the buzzer sound is turned off, use the CH1 current knob to switch the menu steps, and use the CH2 voltage knob to switch the ON/OFF state, light Press "One-key series/parallel/function menu button" to exit the menu.)



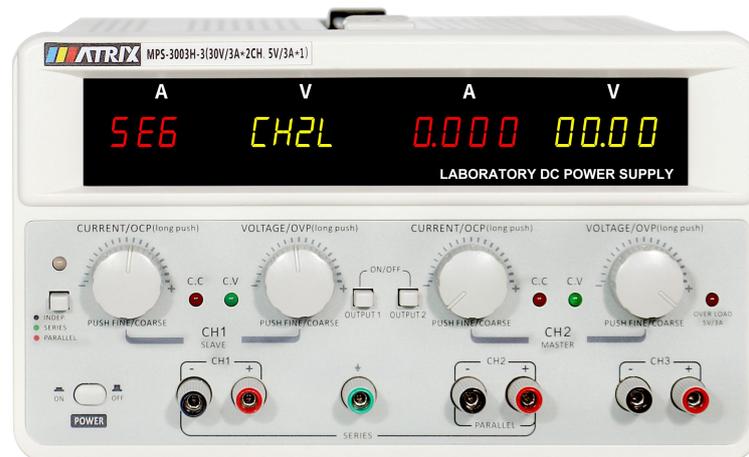
4. CH1 voltage and current lower limit setting: SE4 CH1L 0.000 0.000 (CH2 current display window is the current lower limit, CH2 voltage display window is the voltage lower limit, use the CH1 current knob to switch menu steps, lightly press the CH2 current knob current window value Flashing, you can turn the knob left and right to change the lower limit of current at this time, press the knob to change the setting position, press the CH2 voltage knob, and the voltage window value flashes, at this time, you can rotate the knob to change the lower limit of voltage, and press the knob to change Set the position, tap the "one-key series/parallel/function menu button" to exit the menu.)



5. CH1 voltage and current upper limit setting: SE5 CH1L 5.100 31.00 (CH2 current display window is the current upper limit value, CH2 voltage display window is the voltage upper limit value, use the CH1 current knob to switch the menu steps, lightly press the CH2 current knob current window value Flashing, you can turn the knob left and right to change the upper limit of current at this time, lightly press the knob to change the setting position, lightly press the CH2 voltage knob, the voltage window value flashes, at this time you can rotate the knob left or right to change the upper limit of voltage, lightly press the knob Set the position, tap the "one-key series/parallel/function menu button" to exit the menu.)



6. CH2 voltage and current lower limit setting: SE6 CH2L 0.000 0.000 (CH2 current display window is the current lower limit, CH2 voltage display window is the voltage lower limit, use the CH1 current knob to switch the menu steps, lightly press the CH2 current knob current window value Flashing, you can turn the knob left and right to change the lower limit of current at this time, press the knob to change the setting position, press the CH2 voltage knob, and the voltage window value flashes, at this time, you can rotate the knob to change the lower limit of voltage, and press the knob to change Set the position, tap the "one-key series/parallel/function menu button" to exit the menu.)



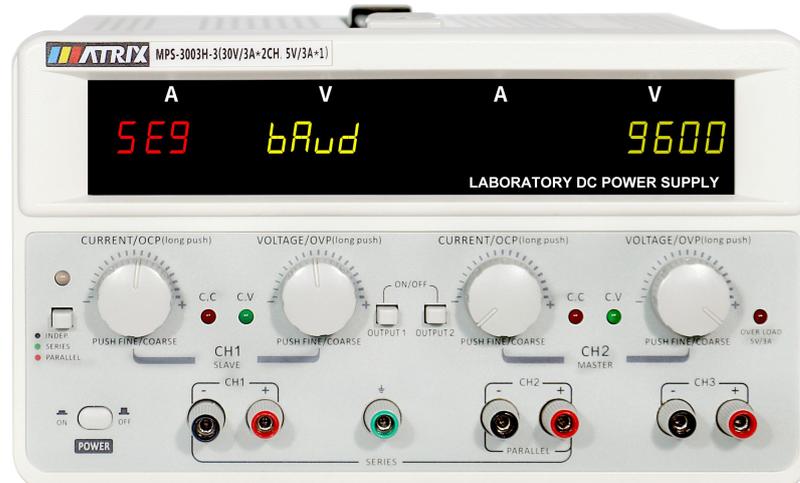
7. CH2 voltage and current upper limit setting: SE7 CH2L 5.100 31.00 (CH2 current display window is the current upper limit value, CH2 voltage display window is the voltage upper limit value, use the CH1 current knob to switch menu steps, lightly press the CH2 current knob current window value Flashing, you can turn the knob left and right to change the upper limit of current at this time, lightly press the knob to change the setting position, lightly press the CH2 voltage knob, the voltage window value flashes, at this time you can rotate the knob left or right to change the upper limit of voltage, lightly press the knob to change Set the position, tap the "one-key series/parallel/function menu button" to exit the menu.)



8. Communication address setting: SE8 ADDR 001 (the communication address can be selected from 1-254, use the CH2 voltage knob to turn left and right to modify)



9. Communication baud rate setting: SE9 BAUD 9600 (Baud rate is 4800, 9600, 19200, 38400, 57600, 115200 to choose from, use the CH2 voltage knob to turn left and right to modify)



10. Communication protocol selection: SE10 PLC SCPI (the communication protocol has two options, SCPI and MODBUS, use the CH2 voltage knob to turn left and right to modify).



11. Communication protocol end character selection: SE11 CEND LF (Communication protocol end character has CR, LF, CRLF, LFCR to choose from, use the CH2 voltage knob to turn left and right to modify).



4.5 CH3 function introduction CH3 is a 5V/3A fixed output channel. When the current is greater than about 3A, the CH3 overload indicator will be lit. When it exceeds 3.3A, the 5V output will be protected. When the light is on or the load is removed when the output is protected, it will return to normal.

4.6 Introduction to OCP/OVP Function Long press the voltage/current adjustment knob to enter the OVP/OCP function setting. When the OVP/OCP value is set and the function is on, the CH1/CH2 output voltage or current exceeds the OVP/OCP setting value. The channel will prompt OVP/OCP and turn off the output. The settings are as follows:

1. OCP setting: long press the CH1/CH2 current adjustment knob to enter the OCP function setting (as shown in the figure below), if you want to change the OCP setting value, you can lightly press the current window number corresponding to the CH1/CH2 current adjustment knob Flashing, turn the knob left and right to change the setting value. When in the setting state, lightly press the knob to change the setting position (CH1 current adjustment knob sets CH1 OCP, CH2 current adjustment knob sets CH2 OCP). If you want to turn on or off the OCP function, you can lightly press the CH1/CH2 voltage adjustment knob and then turn the knob left and right to change the fixed value ON/OFF (ON is to open the OCP function, OFF is to close the OCP function, the voltage adjustment knob of CH1 sets the OCP of CH1 The function is turned on/off, and the CH2 voltage adjustment knob sets the OCP function of CH2 on/off).



2. OVP setting: Long press the CH1/CH2 voltage adjustment knob to enter the OVP function setting (as shown in the figure below), if you want to change the OVP setting value, you can lightly press the voltage window number corresponding to the CH1/CH2 current adjustment knob. Flicker: Turn the knob left and right to change the setting value. In the setting state, press the knob to change the setting position (CH1 voltage adjustment knob sets CH1 OVP, CH2 voltage adjustment knob sets CH2 OVP). If you want to turn on or off the OVP function, you can lightly press the CH1/CH2 current adjustment knob and then turn the knob left and right to change the fixed value ON/OFF (ON is to open the OVP function, OFF is to close the OVP function, the current adjustment knob of CH1 is set to CH1 OVP The function is turned on/off, and the current adjustment knob of CH2 sets the OVP function of CH2 on/off).



3. OCP protection: When the output current exceeds the OCP setting value, the current window of this channel will prompt "OCP" and turn off the output (as shown in the figure below). The CH1 and CH2 channels have independent OCP settings and protection functions. The two channels are not related to each other, only the channel exceeding the set value will be shut down, and the channel will continue to maintain the output state.



CH1 OCP protection hint



CH2 OCP protection hint



4.OVP protection: When the output voltage exceeds the OVP setting value, the voltage window of this channel will prompt "OVP" and turn off the output (as shown in the figure below). The CH1 and CH2 channels have independent OVP settings and protection functions. The two channels are not related to each other, only the channel exceeding the set value will be shut down, and the channel will continue to maintain the output state.



CH1 OVP protection hint



CH2 OVP protection hint

4.7 Introduction to Initialization Function Long press the "one-key series/parallel/function menu button" on the left to turn on the power, the power supply will initialize the "function menu". After the initialization is successful, the power supply will beep three times "di-di-di", and the settings after initialization are as follows:

1. The power-on parameter remains set to ON: SE1 P-ST ON
2. The output status is set to OFF when power is on: SE2 P-UP OFF
3. Set the buzzer sound to ON: SE3 BEEP ON
4. CH1 voltage and current lower limit is set to the minimum value: SE4 CH1L 0.000 0.000
5. CH1 voltage and current upper limit is set to the maximum value: SE5 CH1L 5.100 31.00
6. CH2 voltage and current lower limit is set to the minimum value: SE6 CH2L 0.000 0.000
7. CH2 voltage and current upper limit is set to the maximum value: SE7 CH2L 5.100 31.00
8. Communication address set to 1: SE8 ADDR 001
9. Communication baud rate set to 9600: SE9 BAUD 9600
10. Communication protocol choose:SCPI: SE10 PLC SCPI
11. The end of the protocol communication protocol is selected as LF: SE11 CEND LF

Remarks:

The initial setting value of the upper limit of voltage and current varies slightly depending on the model. After initialization, it is the maximum rating of this model.

### Safety

Do not install substitute parts on the instrument by yourself or perform any unauthorized modification. Please send the instrument to our company's maintenance department for repair to ensure that it can be used safely. Please refer to the specific warning or caution information in this manual to avoid personal injury or damage to the instrument.

### Safety sign

WARNING He reminds the user of certain operations, practices or conditions that may cause personal injury.

ATTENTION He reminds the user of operational procedures, practices, conditions, etc. that may result in damage to



the instrument or permanent loss of data

≡ grounding



High voltage( Do not turn on the machine without professional knowledge)

△ See the warnings in the relevant files and pay attention to the tips. (High voltage, please wear gloves when operating, be careful not to use the machine in safety occasions)

#### Certification and quality assurance

This series of programmable DC power supplies fully meet the technical indicators stated in the manual. Quality assurance The company provides a three-year quality guarantee for the materials and manufacturing of this product from the date of shipment.

#### Maintenance service

If this product needs to be repaired, please return the product to the repair unit designated by our company. The customer shall bear the one-way freight for sending the repaired product to the maintenance department of the company, and the company will be responsible for paying the return freight. If the product is returned to the factory for repair from other countries, all freight, duties and other taxes must be borne by the customer.

#### Quality Assurance Limits

The above guarantee does not apply to damage caused by the following conditions:

Customer's incorrect or inappropriate repair of the product;

Customers use other software or interfaces;

Unauthorized modification or misuse;

Operate this product outside the designated environment, or perform configuration and maintenance at a non-designated maintenance point.

Damage caused by the circuit installed by the customer.

Notice The contents of this manual are subject to change without notice, and the right of interpretation belongs to our company.



## Warranty Card

### What the warranty covered:

If the machine break down due to its defectiveness, MATRIX will provide free maintenance during warranty period. If the machine break down due to wrong operation or carelessness, then Matrix provide paid service within warranty period.

### How long does this warranty last:

This warranty lasts for 3 years from the date of original purchase of all MATRIX branded products.

### Who is covered:

This warranty covers only the original purchaser of this product. This warranty is not transferable to subsequent owners or purchasers of this product.

### What do customers need to do to get repairs/service under the warranty policy?

If the machine get problem, please contact our local distributor. If you cannot find the local distributor, you can contact us directly, our email is [service@szmatrix.com](mailto:service@szmatrix.com), our telephone No. is 0086 755 2836 4276.

### What information do customers need to supply?

Model No.	
Serial No.	
Problem description	
Picture	
Video if necessary	